

Redefining the Engineering Profession and
Reinventing Engineering Education
for a 21st Century Global Knowledge-driven Society

Objective: To develop a new model of engineering in the United States capable of addressing the needs of a 21st Century global knowledge-driven society and provide a roadmap to American universities for the necessary transformation of engineering education.

Challenges:

- Today's engineering colleges are utilizing 19th Century methods in 20th Century institutions to produce engineers for a 21st Century world!
- The changing technology workforce needs of a global knowledge society are changing dramatically the nature of engineering practice.
- The challenge of producing a U.S. engineer capable of adding value several times that of "off-shoring" workforces (e.g., India, China, Eastern Europe).
- Restructuring engineering education to respond to the incredible pace of intellectual change (e.g., from reductionism to complexity, cyberinfrastructure, info-bio-nano technologies, and broader educational needs in areas such as business, law, and social impact).
- Increasing the diversity of the nation's engineering workforce, particularly with respect to gender and ethnicity.
- Enabling American universities and industry to continue to attract the best science and engineering students from around the world.

Approach:

1. Create and lead a team of thought-leaders in redesigning engineering education for the 21st Century.
2. Assess and capture the key elements of previous studies (e.g., Engineer 2020, various NSF programs).
3. Compare innovative approaches to engineering education (both U.S. and international).
4. Conduct surveys (through personal interviews) of key leaders in industry, government, professional societies, deans (Engineering Deans Institute), and faculty.

Products:

1. A roadmap for the re-invention of engineering education.
2. Workshops (a national summit meeting, Engineering Deans Institute).
3. A "book" ("design manual" or "national campaign") making the case for a new breed of engineer, a new approach to engineering education, and a plan for achieving it that would be distributed to every engineering dean and university president.